

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

The Examiner's objection to the drawings under 37 C.F.R. §1.83(a) is not understood. Reconsideration and/or clarification is respectfully requested.

The phrase "controlling optical" is not contained in the claims. If the Examiner intended to refer to the "control means..." recited, for example, in claim 26, then such "control means..." in the exemplary embodiment is already depicted in the drawings as electrodes 130. Accordingly, it is believed that this application is already in compliance with 37 C.F.R. §1.83(a).

The rejection of claims 26-28, 33-51 and 58 under 35 U.S.C. §102 as allegedly anticipated by Furuyama et al. '426 is respectfully traversed.

Furuyama teaches a device with zone plate elements ("ZPE") being used an optical interconnection device in Figures 3 to 7. The other Figures don't show a zone plate device at all.

Furuyama discloses an optical interconnection device for interconnecting circuit boards. There is a series of the devices, designed to propagate a beam forwards while picking light off at each device to produce an electrical signal. The ZPE is a gain device, not electro-optic, and is thus amplifying as well as directional.

Although the intention in Furuyama is to take light off at right angles to the optical axis of the device, it seems almost inevitable that light traveling along the optical axis will be affected. For example, Figures 15B and 15C show a relationship between gain and refractive index.

Claim 26 has been amended to include the feature of claim 42 which is that the ZPE is being used to provide wavelength selective feedback to a laser diode. Claims 39 to 42 are now deleted.

There is no disclosure in Furuyama of using a device such as Furuyama's for wavelength tuning. The electrodes are for providing gain in the active device, not for tuning. It can be seen that they are arranged quite differently from those of the applicant's exemplary embodiment being present as electrodes 104, 105 on the input and output facets as seen in Figure 3B for example. The electrodes 130 of the applicant's exemplary device are on the sides of the ZPE so as to provide an evenly distributed field through the body of electro-optic material.

It could not have been obvious, or even possible, to take the Furuyama interconnection device and use it for tuning another laser diode.

The Examiner's statements about claim 36 (and indeed many other claims) are not understood. The ZPE is certainly not present in Furuyama for providing wavelength selective feedback to the laser as in claim 36. Rather, it is present for achieving

continuity of the ongoing beam, as shown in Furuyama's Figure 6A. In many of the claims, the Examiner quotes text relevant to Figures which don't even show ZPE.

Furuyama is not tuning a laser at all but, instead, using a laser construction to provide gain at an interconnection point so as to control light taken off at that point.

Claim 38 has been amended so that an electrical field is being used to control frequency selection at a point along an optical axis of the device. It is important in the claim 38 invention that frequency selection happens in the object/image plane because then maximum intensity can be fed back to a laser diode with small spot size. Since Furuyama clearly does not teach frequency control at a predetermined point, there can be no anticipated (or suggestion) of claim 38.

Claim 33 is directed to a completely different placing of the electrodes for creating an electric field in the material.

Claim 45 is limited to ZPE having the grating on the rear facet, in contrast with Furuyama's. This emphasizes the completely different purpose of the applicant's exemplary device which receives light at a first end, passes it through material whose refractive index is controlled, and images it with the grating at a second end, for feedback to the laser at the first end. The Furuyama device simply doesn't provide feedback.

Claims 52 onwards, and particularly claim 60, are directed to the use of a waveguide, preferably integrated, which can be used for mode hop control. This is a neat practical arrangement for use in assemblies providing tunable optical sources – and is in no way taught or suggested by Furuyama.

The rejection of claims 29-32 under 35 U.S.C. §103 based on Furuyama '426 in view of Deacon et al. '809 is also respectfully traversed.

Fundamental deficiencies of the primary Furuyama '426 reference have already been pointed out above with respect to parent claims. In this regard, it is noted that claim 31 also requires the predetermined location of imaging be at a facet of the device so that high intensity focused radiation of selective wavelength can be coupled relatively easily to another device.

The Deacon '809 reference is not believed to supply any of the fundamental deficiencies already noted with respect to Furuyama in parent claims above. Accordingly, it is not believed necessary at this time to further analyze additional deficiencies of Deacon '809.

The rejection of claims 53-57 and 59-60 under 35 U.S.C. §103 as allegedly being made “obvious” based on Furuyama '426 in view of Faris et al. '233 is also respectfully traversed.

SIDORIN

Appl. No. 10/046,914

May 10, 2004

Once again, the fundamental deficiencies of the primary Furuyama '426 reference have already been noted with respect to parent claims. Accordingly, it is not believed necessary at this time to further detail the additional deficiencies of the secondary Faris '233 reference.

Attention is directed to new claims 61-63.

Claim 61 is dependent from claim 43 and accordingly allowable for at least reasons already discussed with respect to parent claims.

New claim 62 is based on the prior version of claim 26 with added recitations requiring the predetermined location to lie along an optical axis thorough the device and the control means to switch the optical intensity of the radiation between high and low levels at the predetermined location. This is directed to the switch version shown in Figure 17 of the applicant's specification. It is different from Furuyama in that Furuyama, if anything, is using the zone plate device to keep radiation traveling in a constant fashion along the optical axis.

Dependent claim 63 brings in a further distinguishing arrangement of electrodes.

Accordingly, this entire application is now believed to be in allowable condition and a formal Notice to that effect is respectfully solicited.

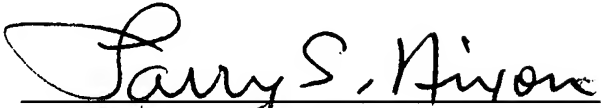
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Respectfully submitted,

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